REPUBLIC OF BULGARIA

MINISTRY OF ENVIRONMENT AND WATER

ISPA STRATEGY FOR ENVIRONMENT

October 2003

CONTENTS

FIGURES

TABLES

List of abbreviations

AMS	Automatic Measurement Station
CM	Council of Ministers
DSP	Desulphurization plant
EEA	Environment Executive Agency
EEAM	Enterprise for Environmental Activities Management
EU	European Union
H	Heating
HEI	Hygienic and Epidemiological Inspectorate
IFIs	International Financial Institutions
ISPA	Instrument of Structural Policy of Pre-Accession
JSC	Joint Stock Company
LCP	Large Combustion Plants
LZW	Lead-and-Zinc Works
MAC	Maximum admissible concentration
MAF	Ministry of Agriculture and Forestry
MEER	Ministry of Energy and Energy Resources
MES	Ministry of Education and Science
MF	Ministry of Finance
MH	Ministry of Health
MoEW	Ministry of Environment and Water
MP	Monitoring point
MRDPW	Ministry of Regional Development and Public Works
MTC	Ministry of Transport and Communications
MV	Motor vehicles
NA	National Assembly
NEMS	National Environmental Monitoring System
NFMW	Non-ferrous metal works
NIMH	National Institute of Meteorology and Hydrology
NPED	National Plan for Economic Development
NSI	National Statistic Institute
PHARE	One of EU pre-accession instruments
POPs	Persistent Organic Pollutants
PWTP	Potable water treatment plant
REDPC	Register of existing dumpsites and past contaminations
RIEW	Regional Inspectorate of Environment and Water
SCWC	Supreme Water Consultative Committee
SG	State Gazette
TPP	Thermal Power Plant
UWWTP	Urban waste water treatment plant
VOS	Volatile organic substances
WBD	Water Basin Directorates
WWTP	Waste water treatment plant

I. INTRODUCTION

Together with other countries of Central and East Europe, as well as Cyprus and Malta, the Republic of Bulgaria is a candidate country of the European Union. In the course of preparation for its accession, the country undertakes different measures to meet the requirements of the A*cquis Communautaire.* In addition to the national source of funds the Republic of Bulgaria is supported by different bilateral donor's agreements and mainly by the Instrument for Structural Policy for pre-Accession /ISPA/. For the Republic of Bulgaria ISPA shall be applied in the period of 2000 – 2006. The initial strategy of the country for the purposes of implementation of the ISPA Program was developed and approved in the period of 1999-2000.

The ISPA financial instrument functions for three years. Taking into consideration also the fact that the Republic of Bulgaria shall have the right to apply for additional financial sources for the coming 3 years, the government has approved the present version updating the document "ISPA Strategy for Environment".

The main purpose of this document is to outline the framework and the trends towards efficient application of the ISPA financial instrument for sector environment only. By taking into account the range of the fields of ISPA Program for the environment sector, the document is focused upon the following three sectors:

- Waste management;
- Air quality;
- Water quality.

The development of this strategy is based on the priorities listed under the "Accession Partnership" (AP) and "Strategy for intensifying the negotiations for accession of the Republic of Bulgaria to the European Union and Action Plan", and Regulation 1267/99 of 21.06.1999 of the European Union for ISPA, as well as on the implementation programs of the Directives of the European Union covered by ISPA, developed in 2003, for which the Republic of Bulgaria has negotiated transitional periods[1].

ISPA is an important financial instrument for the realization of the accession policy within the environment sector. The present Environment strategy and the measures set up herein are an integral part of the National Plan for Economic Development (NPED) 2000-2006.

II. BRIEF REVIEW OF SECTOR ENVIRONMENT

The territory of Bulgaria covers 110 993,6 m[2]. The total length of its boundaries is 2,245 km, of which - 52,6% land areas; 30,6% river areas, and 16,8% sea areas (as according to the NSI[2] data).

The country is divided into 28 regions and 262 municipalities. The population of Bulgaria, as per at 01.03.2001, is 7,932 984[2] inhabitants. More than one half of which (51,6%) is concentrated at 40 towns with more than 25 thousand inhabitants. 32,3% of the population lives in the largest towns of Bulgaria with more than 100,000 thousand inhabitants, which is approximately one

[1] Implementation programs falling into the ISPA range are related to the following Directives**:**
Directive 91/271/EC related to the town waste water treatment;
Directive 2001/80/EC related to certain LCP air pollutants restriction;
Directive 1999 /31/EC related to waste disposal;

[2] According to data published by the National Statistic's Institute (See http://www.nsi.bg/statistika/Statistics.htm).

third of the whole population. Nine of Bulgarian towns with population of more than 100 thousand inhabitants are: Sofia, Plovdiv, Varna, Bourgas, Russe, Stara Zagora, Pleven, Sliven and Dobrich. Sofia is the capital of the country, with population of 1,173,988 inhabitants, followed by the towns: Plovdiv (338 302), Varna (320 668), Burgass (209 479), Ruse (178 435), Stara Zagora (167 708), Pleven (149 174), Sliven (136 148) and Dobrich (100 000). The average density of the country population is 71,5 inhabitants per km^2. The regions of Sofia, Plovdiv and Varna are the most urbanized ones.

2.1 Air

The Republic of Bulgaria has developed a National Air-monitoring Network. In year 2001 76 monitoring points became operative 13 of which are automatic measurement stations. Air quality monitoring covers the whole territory of the country and in particular locates in 34 regions, as in accordance with Regulation Nr.7 (State Gazette 45 of 1999) for ambient air quality assessment and management, where a potential risk of human health impact does exist. These are regions with large urban centres or with less inhabited areas with large industrial enterprises emitting pollution. Regulation Nr.9 (SG Nr.46 of 1999) on the limit values for sulphur dioxide, nitrogen dioxide, fine particulate maters and lead in the ambient air gives deviations permitted, which are progressively reduced for achieving the required values:

- for sulphur dioxide – before year 2005;
- for nitrogen dioxide – before year 2010;
- for fine particulate maters – before years 2008 and 2010;
- for lead – before year 2005.

A new Regulation to the Clean Air Act (CAA) concerning limit values for admissible emissions (exhausted gases concentrations) of sulphur dioxide, nitrogen oxides and dust, released in the ambient air from large combustion plants shall come into force before Sept. 30, 2003.
Thereby, the requirements the Directive 2001/80/EC shall be fully transposed to the national legislation.

Table 1 shows the emissions of harmful substances in the ambient air for year 2001 divided by categories and sources.

Group of emission sources	SOx[3]	NOx[4]	NMVOCC[5]	CH4	NH3	CO
1	2	3	4	5	6	7
N1.TPP	813.826	55.749	1.043	1.043	-	3.372
N2. Domestic combustion	21.912	3.517	18.526	13.006	-	305.188
N3. Combustion processes in industry (including power production)	49.367	13.944	1.255	1.026	-	64.774
N4. Non-combustion production processes	22.011	19.054	13.164	2.155	11.722	38.781
N5. Mining and processing of fuel resources	0.003	-	0.806	457.485		-

[3] - estimated as sulphur dioxide
[4] - estimated as nitrogen dioxide
[5] NMVOC – non-methane volatile organic components

N6. Solvents application			20.491			
N7. Road transport	2.891	54.591	32.121	1.001	0.022	189.891
N8. Other transport	29.799	37.257	5.966	0.298	0.004	14.926
N9. Waste treatment and disposal	0.043	0.120	0.456	22.911	10.235	0.150
N10. Agriculture	-	3.621	29.178	104.082	34.104	1.883
N11. Natural sources	-	3.027	177.685	14.784	-	137.225
Total*[6]	**939.852**	**190.88**	**300.691**	**617.791**	**56.087**	**756.19**

Table 1 – Emission of harmful substances in the atmospheric air for 2001 by categories of sources (by 1000 tones per annum)[7]

Table 2 provides information on the emissions of heavy metals and specific organic contaminants in the ambient air for year 2001 divided by categories of sources.

Group of emission sources	Mercury t/annum	Cadmium t/annum	Lead t/annum	**Polyaromatic hydrocarbons /PAH/ t/annum**	**Dioxines and furines kt/annum**
1	**2**	**3**	**4**	**5**	**6**
N1.TPP	1.580	0.613	5.034	7.877	102.049
N2. Domestic combustion	0.230	0.201	0.349	39.811	44.920
N3. Combustion processes in industry (including power production)	1.706	9.102	124.193	1.227	8.325
N4. Non-combustion production processes	0.116	0.219	12.427	16.984	20.464
N5. Mining and processing of fuel resources	-	-	-	-	-
N6. Solvents application	-	-	-	-	-
N7. Road transport	-	0.010	33.419	28.908	6.241
N8. Other transport	-	0.007	-	2.526	11.494
N9. Waste treatment and disposal	0.361	0.242	1.975	0.005	7.362
N10. Agriculture	-	-	-	-	-
N11. Natural sources	-	-	-	-	-
Total[8]	**3.993**	**10.394**	**177.397**	**97.338**	**200.855**

Table 2 – Emission of heavy metals and specific organic contaminants in the ambient air for 2001 by categories of sources (by 1000 tones per annum)

2.2 Water

Surface watercourses and basins

[6] - data of the National Institute of Statistic and the Ministry of Environment and Water are used;
[7] The emissions by groups of sources and atmosphere contaminants are estimated as per the Methods of determination of emissions of harmful substances in the atmosphere, approved by the MOEW.
[8] - Data of the National Institute of Statistic and the Ministry of Environment and Water are used.

The total length of the river network is 19761 km. The number of points of NEMS - "Water" subsystem is 253, covering 3685 km. Water quality monitoring of the surface and underground water provides information on the physical and chemical processes conducted in the water basins, needed for the optimal water basins management.

The surface water flows quality according to Regulation Nr.7 (SG, Nr.96 of 1986) for water surface quality norms and limits, and the related Act of the MOEW Nr.RD -272/03.05.2001 on the categorization of surface water of the water basins is shown in the following Table:

Category	I	II	III	Outside III category
Points falling into respective category (%)	4	38	34	24

Table 3 – Surface water flows condition[9]

- Ist category - water used for potable purposes and foodstuff industry;
- IInd category - water used for watering-places, water sports, fishing;
- IIIrd category -water for irrigation and industry;
- Outside the IIIrd category the highly contaminated water is classified, which can be used only for agricultural needs.

For the purposes of Directive 91/271/EU the "sensitive zones" within the meaning of this Directive needs to be determined.

A Feasibility Study for "sensitive zones" identification covering all South Bulgaria rivers (being two of the forth river basins in the country) has been conducted under PHARE Cross Border Co-operation programme between Bulgaria and Greece – "Feasibility Study for identification of sensitive zones for Mesta, Tundzha, Struma, Arda and Maritza River Basins", in accordance with Directive 91/271/EU criteria. Appendix 3 provides list of the territories defined as "sensitive zones" by Order of the Minister of Environment and Water RD-970/ 28.07.2003.

For the rest of the country territory the following approach shall be applied: the Danube River and the Black Sea shall be declared as "sensitive zones" by the Minister's of Environment and Water Order before the end of year 2003. Therefore, all agglomerations discharging directly into the Danube River and the Black Sea should be treated according to Article 5.2 and 5.3 of this Directive. All water-receiving bodies within the Danube River Basin and Black Sea Basin shall also be defined as "sensitive zones" by the order of the Minister of Environment and Water till the end of year 2003. Thereby, all agglomerations within these water-receiving bodies shall be subject to Article 5.2 and 5.3 of this Directive. While implementing the Directive Bulgaria shall also consider the possibility offered by Article 5.4 depending on the available studies and circumstances.

2.3 Waste

Data on domestic and construction waste is collected and processed by the EEA and NSI, covering settlements presenting 80% of the country population. Domestic and construction waste data base consists of information concerning the operating and the already closed (old waste contamination sites) landfills and the collected waste quantities, as required by Regulation Nr.10 on the filling out of the report and the waste management information documents (SG Nr.151/1998).

[9] National environmental strategy and plan of action 2000-2006 г.

REDPC as part of NEMS is maintained. The Register consists of information for all existing domestic waste disposal sites from all urban settlements, some rural municipal centers serving several settlements, construction waste disposal sites and inert materials, and industrial waste disposal sites, where domestic and construction waste from the respective municipalities are disposed. The Register represents an open system, and as to 31.12.2001 it includes 391 items.

For year 2001 information about 326 existing dumpsites and past contaminations has been collected. On Figure 1 - distribution of existing dumpsites and past contaminations is shown, according to data of 2001. Reduction of the reserved areas down to 704.9 hca (15 % less compared to 2000) is due to non-complete information about the past contaminations for 2001. The reported past contaminations areas are 0.1 hca, while being 167.9 hca year 2000.

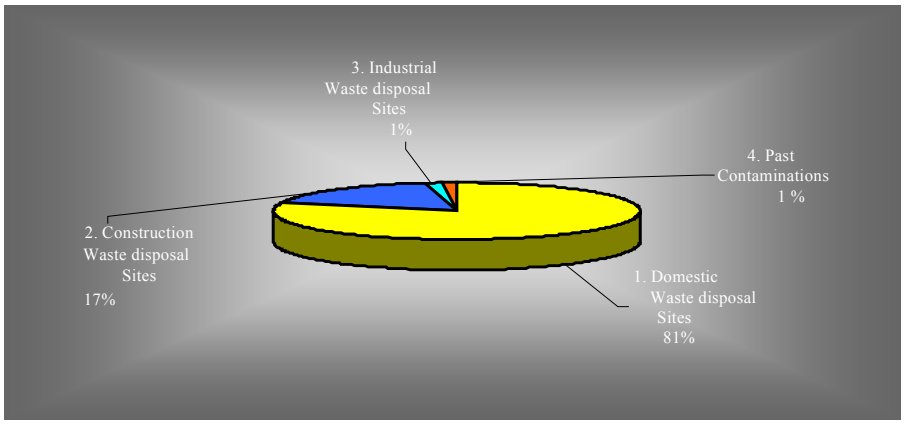

Figure 1 – Distribution of existing dumpsites and past contaminations (2001)

Distribution of waste generated by type is shown in Table 4

Year	Generated waste (kg)			
	Domestic waste	Construction waste	Industrial waste	Hazardous waste
2001	3037.96	789.7	2321.943	755.766

Table 4 – Distribution of the waste generated by type

Before year 2000 the waste in the landfills has not been weighed and the submitted data is based on the official data collected by the municipal administration. This information provides the number and the volume of the waste storage equipment, as well as the number of waste disposals.

Domestic waste

For year 2001 3 210 846 tones of domestic waste were reported, collected by 6 360 864 inhabitants (living permanently and temporarily in the country). This quantity is related to 505 kg per inhabitant, and it is by 13 kg less compared to 2000. As to 31.12.2001, according to data of the NSI, the number of landfills serving the organized waste collection is 663, and the volume of the domestic waste as disposed is 3 318 kg. The most of the landfills were reported as such for domestic waste, but in practice, they are mixed domestic, construction, industrial, and in some

cases also hazardous. It is still a common practice the disposal of hospital waste to the municipal waste disposal sites.

For the period of 1998 – 2001 a tendency towards reduction of domestic waste collected per capita annually was noticed, since more precise information was supplied. This became possible thank to the introduced waste disposal weighing and better monitoring performed by the municipal administration and Regional Environment Inspectorates with regard to activities on the waste management.

Construction waste

For year 2001 – 789.7 kg construction waste were reported. 71% of them were disposed to 35 construction waste disposal sites. The remaining quantities were disposed to domestic (181.2 kg) and industrial (51.1 kg) waste disposal sites. In the most of the cases the construction waste are used for covering of the domestic waste as disposed.

Industrial and hazardous waste

According to the national legislation requirements persons whose activity generates industrial and hazardous waste shall submit an information card. It has to consist information that separates waste generated by type, quantity and content, as well as by methods and facilities for waste utilization and disinfections. The information cards are then processed by the Environment Executive Agency.

According to the information available for year 2001 - 25 033 kg waste resulting from mining and processing operation (rock and soil masses are not included) are disposed to specialized landfills. 13 063 kg of them are accounted as industrial waste. The waste generated from dressing are 24 363 kg, of which 11 969 kg are reported as being hazardous. Due to extremely big quantities and their specificity, the waste resulting from mining and processing operation, are not subject to further comments.

Industrial waste

The industrial none-hazardous waste generated in 2001 was 8 183 kg. 91 % of them were removed by disposal, amounting to 7 451 kg.

Of highest relative share is the group of non-organic waste generated from thermal processes – about 38%, followed by the group of waste generated by non-organic chemical processes – with a share of an approximately 35%, and those generated form agriculture and the foodstuff industry.

The largest amount of industrial waste was generated within the regions of Stara Zagora, Sofia and Varna. This is mainly due to the fact that big waste generators are presented within the above stated regions, which are the thermal and electrical stations in the complex "Maritza East", Kremikovtzi-Sofia, Umikor-Pirdop, Eurometal-Pernik, Agropolichim-Devnja and Solvey-Sodi-Devnya.

Hazardous waste

The institutions within the system of the Ministry of Environment and Water collect all data

related to the hazardous waste by covering the territory of the whole country.

According to data for year 2001, presented by 852 enterprises, which activity is directly liked to hazardous waste generation or treatment, the total quantity of the hazardous waste generated in Bulgaria is 755 766 tones /year 2000 - 757 817/.

The information presented by these enterprises shows, that during year 2001 the largest share belongs to the group of ***non-organic waste from thermal processes*****/53%/,** followed by the group of ***waste from the petrol refining /21%/*** and by the sub-group 19.08.00 – ***waste generated from waste water treatment plant /8%/.***

Thirty enterprises generate 97% of the total hazardous waste in Bulgaria. The largest are: Kremikovtzi-Sofia and Lukoil-Nephtochim – Bourgas, who has reported 49% of the annual quantity. Traditionally, the list of the largest hazardous waste after Kremikovtzi-Sofia and Lukoil-Nnephtochim – Bourgass is followed by the Lead-and-Zinc Works– Kardzhali, Non-ferrous metals works – Plovdiv, and Steel Industry – Pernik.

In 2001 the main way of hazardous waste treatment remains its disposal /516 883 t/. Compared to the previous year the share of the hazardous waste disposed has been increased by nearly 5%.

Hazardous waste	Quantities for 2001 (tones)
Generated	755 765,99
Disposed	516 882,58

Table 5 - Hazardous waste (2001 r.)
Source of information: EEA

III. MAIN OBJECTIVES OF THE BULGARIAN POLICY IN THE ENVIRONMENTAL SECTOR

3.1 Objectives

The long-term strategy objective for Bulgaria in the field of environment is the improvement of the quality of the human life in the country through provision of friendly environment and nature conservation, based on its sustainable management.

It should be emphasized that in the early nineties the most important goal for the national environmental policy was the necessity to set up in the Bulgarian legislation the main principles for environmental protection such as arising of public awareness and participation of the public in the decision taking process, the application of "polluter pays" principle and the prevention control. This goal is already achieved and the main challenge for the policy in all sectors of the country's economy, including the environment, is to create all necessary condition (legislative, institutional, etc.) for the full transposition and implementation of the EU Acquis.

The Republic of Bulgaria has developed "National Strategy for Environment and Action Plan 2000-2006". It contains the main principles, goals and measures, which have already been introduced to the National plan for economic development of 2000-2006 in the "ISPA Strategy for Environment", also in other programs and strategies for sector Environment.

The achievement of the **main objectives** of Bulgarian policy is in full compliance with the

priorities laid down in the "Accession Partnership" document. The most effective instruments for its implementation are:

- Transposition to the Bulgarian legislation of the requirements of the European directives in the field of environment, in compliance with priorities laid down in the"Accession Partnership" document: the process of transposition of the framework legislation in the areas of water, air and waste to be completed before the end of year 2003.

- Preparation of implementation programs and plans at national and local levels for practical application of all legislation requirements. In order to complete the negotiations under Chapter 22 "Environment", the Republic of Bulgaria has presented 10 implementation programs for EU Directives application, where at 7 of them a transition period was declared. In these programmes the main purposes are determined, which have be accomplished by the different sectors. They include priority investment projects based on general and specific criteria prioritization, the financial investments needed for their realization, potential financial sources, as well as systems for implementation and monitoring.

- Combining of requirements to the environment protection, with restructuring of economy based on the market development;

- Informing and attracting the public in the environmental problem solving,

- improving the control performance of the main institutions and the local authorities for observing of the environmental legislation ;

- Maximum mobilization and effective coordination of the financial resources in the realization of the ecological projects.

The **specific objectives** are formed based on the national priorities and commitments following from the signed and ratified by Bulgaria global and regional conventions and all related protocols.

3.1.1 Air quality improvement objectives

The long-term strategic objectives are the following:

- **Meeting the requirements of the standards for ambient air quality in settlements, where "hot spots" are situated;**
- **Abatement of the concentration of harmful substances emissions in regions with "hot spots";**
- **Phasing out of trans-boundary pollution (emission of gases) for the towns located at the Danube river valley.**

The objective of the air quality protection policy is to reach the recently introduced limits for contents of harmful substances in the ambient air, according to the European Framework legislation and the daughters EU Directives, through elaboration of the respective long-term programs for the improvement of the air quality and their action plans. The programs will be prepared by the municipalities, where the "hot spots', mentioned in the above chapter 2, are situated. These programs will also be co-ordinated with the respective Regional Inspectorates on Environment. During the year 2001 a Pilot Program for one of these areas has been elaborated with the PHARE financial assistance. The deadline for all programmes preparation is end of year 2003. The schedule for the programs' implementation is in compliance with the

above-mentioned EU Directives: in the year 2010 - achieving the compliance for the SO2, NO2 and lead emissions and in the year 2013 - meeting the requirements for limits of PM 10.

3.1.1.1 Emissions reduction objectives

The Table given below illustrates the National development plans for restriction of the related emissions.

	1995	1996	1997	1998	1999	2000	2005	2010
SOx incl. SO_2 (thousand tones per annum)	1476	1420	1365	1251	942.6	1226	890	856
NOx incl. NO_2 (thousand tones per annum)	266	259	225	223	202.1	280	270	266
NH_3 (thousand tones per annum)	99	83	77	66	59.53	109	113	108
NMVOCs (thousand tones per annum)	173	147	120	132	118.4	185	194	185
CO (thousand tones per annum)	846	613	515	650	616.9	820	800	750
CH_4 (thousand tones per annum)	506	495	533	553	479.9	451	420	420
CO_2 (mln. tones per annum)	63	60	59	55		68	88	101
Pb tones	297.49	278.81	231.24	250.78	223.5	347.00	170.90	176.70
Cd tones	12.82	14.33	14.23	14.87	13.569	12.20	12.50	11.90
Hg tones	6.88	4.70	4.31	4.69	4.064	6.60	6.50	5.80
Dioxin and furans (grams per annum)	456.00	340.94	309.58	288.43	245.28	453.10	433.30	425.00
HCB (kg)	0.079	0.087	0.047	0,076	0.046	84	87	109
PAHs (tones per annum)	521.43	487.51	419.30	384	286	542.00	574.00	621.00
PCP (kg)	10.72	10.61	7.54	9.07	6.36			
PCPs (kg)	382.19	261.73	226.99	252.87	234.16			

Table 6 – Emission of contaminants in the atmosphere by anthropogenic sources for 1995-1999 and the related forecast up to 2010 r. (thousand tones)[10]

The analyses of the main pollutants show that local problems with the air pollution exist at some settlements in Bulgaria. Unfortunately, these are often the biggest towns, including the capital, where the main part of the population of the country lives (about 40 %). The air quality of these settlements is directly dependant on the different emission sources.

The data given in the Table shows reduction of almost all main pollutants, excluding methane and cadmium, for which slight increase has been noticed.

[10] National Strategy for Environment and Action Plan for 2000-2006 r.

3.1.1.2 Objectives of the Framework convention of the United Nations towards the climate change, and the Kioto Protocol.

According to the National Action Plan as developed with respect to the climate changes, the relative measures regarding the reduction of general emissions have been applied. The main objective set is the reduction to minimum of the emission levels:

Emissions per annum	1988	2000	2005	2010	2015	2020
CO_2	96 878	61 741	69 965	72 501	79 060	73 462
CH_4	29 667	19 509	27 951	29 232	30 786	33 243
N_2O	9 548	10 850	12 400	13 020	14 880	14 570
Total	**136 093**	**92 100**	**110 316**	**114 753**	**124 726**	**121 275**

Table 7 – Emissions of greenhouse gases estimated in CO_2 equivalence – an alternative of total reduction of emissions, tones CO_2 equivalence

According to the above scenario the emissions must be reduced in 2008 by 17.5 compared the basic year, and in 2012 - by about 14%.

3.1.1.3 Reducing the production and use of hydrochloro fluoro carbons (HCFC) under the Convention and Protocol of Montreal.

While implementing its obligation, resulting from the Vienna Convention and the Montreal Protocol, including the relative supplements, Bulgarian Council of Ministers approved in 1999 a special Decree Nr. 254 related to the management and control of the ozone-depleting substances. This document became effective on 01.01.2000. On the ground of this document the trading with HCFC became banned on the territory of the country, as considered from 31.12.2010, and their use – as from 31.12.2011.

3.1.1.4 Objectives for liquid fuels quality improvement, and the future prevention and restriction of harmful substances emissions.

- Implementation of the national program for phasing out lead benzenes production and use, and of such specified in the European standards on the liquid fuels quality.
- Introduction of a national system for liquid fuels quality control.
- Introduction of a national system for standard motor vehicles approval.
- Development and application of sector programs and plans for prevention and reduction of emissions from stationary sources, including:
  - National program for reduction of emissions from the operating LCP;
  - Programs for reduction of emissions from VOS and POPs from certain productions activities (usage of solvents, petrol products storage and transportation, etc.).

3.1.2 Water quality improvement objectives

For supplying of water of the required quantity and quality to the population, and to the industrial sector, the main objectives that the country should achieve:

- Prevention and improvement of underground and surface water quality;
- Supplying necessary quality and quantity of drinking water;
- Resolving the problems existing in the water supply;

- Supplying of water for irrigation and for the industry;
- Public Awareness for proper water resources use;

3.1.3 Waste management improvement objectives

The main objectives of Bulgarian policy regarding the waste management, set out in the waste management national program are:

- Prevention and reduction of waste generation;
- Waste reuse and recycling;
- Improvement of waste collection and transportation;
- Environment sound waste management and construction of integrated facilities;
- Past contaminations risk reduction;
- Legal regulation of the waste management;
- Public awareness;
- Improvement of monitoring and control systems.

3.2 Institutions

3.2.1 Ministry of Environment and Water (MOEW)

The Government is directly engaged in making decisions and taking positions related to the environment protection, where the central state institution responsible for the environmental policy implementation is the Ministry of Environment and Water. The Ministry of Environment and Water is responsible for:

- Development and implementation of the national policy in the field of environment;
- Development of Environment Regulations, and their harmonization with the related European Union Legislation;
- Management of EEAM and internationally funded projects in the field environment, including funds EU pre-accession funds;
- Preparation of the country position in the field of environment in the process of negotiations with the EU
- Coordination of other institutions activities regarding the environmental policy implementation;
- Management of the protected zones, being an exclusive state property;
- Management and distribution of water resources in the country, including mineral water, being an exclusive state property;
- Development of the policy for exploration and use of underground resources;
- Issuing EIA Resolutions for large investment projects with national importance, as well as obtaining of permits for waste handling, licenses for import, transit transfer and export of hazardous waste, spices of the wild flora and fauna in danger, prospecting and exploration of underground resources.
- Public awareness about the state of the environment.

For smooth implementation of the Accession Partnership objectives, and consolidation of the administrative capacities for management and control of the pre-accession funds, a Directorate "European Union Funds for Environment" was established within the Ministry of Environment and Water. The Directorate is responsible for the project preparation, operative management and coordination of the entire project implementation. The functions of this Directorate are:

- Preparation of programme documents for absorption of EU granted funds through the pre-accession instruments, as well as through the Cohesion Fund;
- Project preparation for funds application through the pre-accession instruments, as well as through the Cohesion Fund;
- Preparation, coordination and administration of the whole tender procedure;
- Project management and implementation;
- Financial management of funds granted by the European Union for the approved projects, including accounting system maintenance and update;
- Project progress reporting to the institutions responsible for monitoring and control of the funds granted by the European Union;
- Coordination of activities related to the funds granted by the European Union for sector environment with all national and international institutions involved.

3.2.2 Environment Executive Agency (EEA)

EEA is a specialized structure of the Ministry of Environment and Water, which:

- Exercises monitoring and analytic-laboratory activity;
- Carries out methodical guiding for RIEW, of the measurements and analysis performed;
- Collects and processes data on the state of environment, and issues the related bulletins;
- Prepares and issues annual report on the state of environment in Bulgaria;
- Coordinates activity of other institutions engaged in gathering and processing of environmental information.

3.2.3 Enterprise of environmental activities management (EEAM)

EEAM (former National Environmental Protection Fund) has a statute of a state enterprise within the MOEW, as states at Article 60 of the Environment Protection Act. This enterprise is the main source for environmental funding and co-funding of projects, besides the international financial institutions. Its experts participate in the project cycle by exercising monitoring and control to the project implementation, through monitoring and control mechanisms settled down for investment projects.

3.2.4 Regional Inspectorates for Environment and Water (RIEW)

Fifteen RIEW have been established as legal authorities of the Ministry of Environment and Water, having the following main functions:

- To control enforcement and application of the environment legislation;
- To render help to the municipalities in the process of local environmental policy implementation;
- To aware the public about the state of environment;
- To issue EIA Resolutions for projects and activities of regional importance, to issue licenses for waste handling activities, the water use and the use of watercourses;
- To supply data from the respective regions to the national environment monitoring system;

3.2.5 Water Basins Directorates (WBD), and Supreme Water Consultative Committee (SWCC)

The Water Basins Directorates were established at four regions purposed for the water basin control of the Danube region, Black sea region, Eastern White Sea region and West White Sea region. The Water Act specifies their boundaries and the towns, where the Water Basin Directorates have been established such as: Blagoevgrad, Varna, Plovdiv and Pleven. The Water Basin Directorates are responsible for the implementation of integrated management of the water quality and quantity. In order to manage and coordinate the activities of the four Water Basins Directorates a "Water" Directorate is established within the Ministry of Environment and Water. The main functions of these Water Basins Directorates are:

- to organize the development of the water basin management plans;
- to issue the relative licenses;
- to implement at water basin level the national water monitoring;
- to keep registers of the relative licenses, and to control the enforcement of their terms and requirements ;
- to organize and manage the collection and control of the results obtained from the monitoring; delivering and updating of data for wastewater needed for the information system;

A Supreme Water Consultative Committee was assigned in order to support the MOEW in the water policy. It includes representatives from the MOEW, MRDPW, MAF, ME, MLS, MH, MF, MEER, Civil Protection, Bulgarian Academy of Science, the municipalities, non-governmental organizations in the field of water sector, etc. This committee renders assistance to the Water Basins. It works at a voluntary principle.

3.2.6 Other central state authorities

- The Ministry of Health (MH): carries out monitoring of the impact of the components of the natural and labor environment and nourishing upon the human health, as well as develops the governmental policy on the prophylactic health measures application, and water quality;
- Ministry of Agriculture and Forestry (MAF): carries out activities related to the protection, recultivation and maintenance of soil fertility, protection of water basins form contamination by nitrates from the agricultural sector, and forestry use and protection;
- Ministry of Regional Development and Public Works (MRDPW): applies the national policy in the field of the regional development and public works, construction of water supply and sewerage system, as well as is engaged in the preparation of the national plan of regional development;
- Ministry of Communications and Transport (MCT): develops the rates of the hazardous substances emitted by the traffic vehicles, and exercises control on their application.
- Ministry of Finance (MF): provides the required financial resources to the sites of ecological priority within a given municipality from the state budged, in collaboration with MOEW; prepares legal regulations with respect to the domestic waste taxes; excises and ecological taxes on the liquid fuels; assists the MOEW in the preparation of other environment protection taxes, conducts negotiations and applies the state policy with respect to the governmental loans, with the International Monetary Fund, including concerning environment protection projects;
- Ministry of Energy and Energy Resources (MEER): develops and applies the governmental energy policy, including planning, implementation and control of the results form the implementation of the measures on the restriction of the harmful impact upon the environment from the power engineering operations;

- Ministry of Education and Science (MES): it is responsible for the development and introduction of educational programs in the environmental field at all educational system levels.
- Customs Agency to the Ministry of Finance: controls the import-export of the flora and fauna spices in danger, as well as of waste and of hazardous substances.
- Civil Protection State Agency established to the Council of Ministries: it is responsible for the development and application of the regulations on the emergency situations, disasters and averages, incl. those, which may be harmful and could create risks for the environment.

3.2.7 Other central state specialized authorities

- Agency of Nuclear Regulation: carries out the regulation in the field of the nuclear and radiation protection;
- Power Efficiency Agency: carries out the development and assists the policy implementation on efficient energy consumption, and of alternative energy sources;
- Meteorology and Technical Supervision State Agency: acts as a National information center;
- Bulgarian Standardization Institute: carries out the development, updating and harmonization of the Bulgarian standards with the environment management international and European ones.

3.2.8 Municipal Authorities

The municipal authorities play an important role in the implementation of the environmental policy. Their main functions are:

- Development of environmental protection programs;
- Development of entire policy at local level for collection, transportation, removal of domestic waste, including policy application;
- Control of waste and of hazardous substances disposal within the territory of the municipality;
- Construction, maintenance and operation of UWWTP and domestic waste disposal sites;
- Public awareness about the state of environment;
- Law enforcement in the area of environmental protection within small sites of local importance;

3.3. Institutions responsible for strategy implementation, monitoring and assessment

Ministry of Environment and Water – is the institution responsible for the overall implementation if this strategy, as well as for its realisation. The MoEW is responsible also for implementation of those of the ISPA Measures for which is an Implementing Agency.

Ministry of Regional Development and Public Works - as an institution being responsible for some of ISPA Measures realization it is also responsible for strategy implementation.

Ministry of Energy and Energy Resources - as an institution being responsible for some of ISPA Measures realization it is also responsible for strategy implementation.

Ministry of Finance – presented by the National ISPA Co-ordinator is responsible for monitoring and assessment of the result achieved as a consequence of ISPA Strategy

implementation.

IV. BRIEF REVIEW OF ENVIRONMENT SECTOR INFASTRUCTURE

4.1 Air

Thirty-one Large Combustion Plants fall into the range of Directive 2001/80 EC (23 power and 8 industrial ones). At present, at these 31 BCF, over 200 steam-boilers and water-heating boilers are operative.

The LCP have been established as joint stock companies with 100 % state participation, and they are controlled by the management bodies of the MEER such as: TPP "Maritza East 2", TPP "Maritza East 3", TPP "Brikel", TPP "Bobov dol", TPP "Maritza 3" TPP "Republika", TPP "Varna", TPP "Sliven", TPP "Russe East", PTS "Kazanlak", TPP "Gabrovo", TPP "Tarnovo", TPP "Plovdiv North", TPP "Shumen", TPP "Vratza Mladost", TPP "Plovdiv South", TPP "Bourgas", TPP "Pleven", TPP "Vladislav Varnenchik". TPP "Sofia" has mixed municipal and state property, and MEER controls it.
For the period of 1996- 2000, SO_2 emissions in Bulgaria, emitted by LCP were appr. 1082 kt, while the emissions of NO_x - appr. 45,2 kt.

In this period, at the above stated plants, no desulphurization plant (DSP) was constructed. Approximately 85% (84,78%) of the emissions of SO_2 were generated from the three thermal power plants, located at the Maritza East complex. The analysis of the data from these emissions shows, that the introduction of desulphurization facilities at TPP "Maritza East 2", TPP "Maritza East 3" could greatly reduce the total emissions of SO_2, as a whole.

A number of studies (World Bank and other institutions) shows that if at these two station, desulphurization facilities are introduced, the country will then easily meet its obligations under the Protocol of Geoteborg, and will thus register SO_2 emissions of much lower concentration, then the determined limit.

4.2 Water

4.2.1 Potable water supply

For potable and domestic water supply of settlements, only 8-10% of the existing water resources are used. Even though, it is of extreme importance for the town planning and improvement of the population living standard.

Within the most of the settlements, central water supply systems have been constructed, serving 98,6 % of the population. 5 031 locations are water supplied, representing 84,6 % of the total number of settlements. The total water supplied for potable and domestic needs is 1 141 162 thousand.m^3, of which the water quantity used is 444 469 thousand.m^3, representing 38,95% of the water supplied. Depending on the nature of the water supply sources, it is distributed as follows:

- from surface flowing waters - 80 096 thousand m^3 (7,02%)
- from underground sources - 543 516 thousand m^3 (47,63%)
- from surface water dams - 517 550 thousand m^3 (45,35%).

The population of the towns and villages is supplied from 11 dams with a total volume of 1 158.4 mln. m^3.

The national water supply system consists of the following main facilities:

- 50 000 km water supply system for the inhabited territories;
- 24 000 km water supply systems outside the inhabited settlements;
- 11 dams intended for water supply purposes;
- 42 potable water treatment plants;
- 6 087 drinking water reservoirs;
- 3 560 water supply pumping stations;

At present, another 7 dams are under completion and extension, as well as 7 potable water treatment plants, and other water supply facilities.

About 73.4% of the water supply network is constructed of asbestos-cement pipes, 14.5% of steel and galvanized pipe installations, 2.5% of to cast iron pipes, 2.1% PVC pipes and 7.5% concrete pipes [11].
In the country, for domestic water supply 4 757 of watercourses are used, of which 334 are surface watercourses. The treatment facilities (for potable WTP and others) have been constructed at only 87 of the surface watercourses.

Monitoring of the potable water is carried out at 8 389 points of the water supply system at these settlements.

During the year, according to Regulation Nr.9 on water quality for potable purposes, /SG Nr.30/2001/ 25 284 numbers of samples were analyzed as per the permanent Check monitoring indexes, according to Directive 98/83/EU), and 3 526 of samples under the permanent Audit monitoring, according to Directive 98/83/EU).

Within these analyses, 194 157 number of studies were conducted as per the chemical, organoleptic and radiological indexes, of which some 4,12 are not in compliance with the respective requirements, and 84 519 numbers of studies – as per the microbilogical indexes, of which 14,10% does not meet the respective requirements. As a whole, the standard water value of the potable water of the country for 2002 is 90,89%. The highest percentage of non-standard values diverging from the chemical and organoleptic indexes was notices at Yambol district - 18,72%, and by a by microbilogical indexes - at Razgrad district - 53,24%.

4.2.1.1.Main problems related to potable water quality in the country

Non-consistencies with the microbiological indexes (14,10% non-consistency for 2002г.)

The problem is of great importance, as far as the recommendations given by the World Health Organization allow up to 5% non-standard values, therefore it creates direct risk to the consumers' health. The problem is of national importance and is related to the territory of the whole country, mostly, the smaller water supply systems supplying water to villages and small towns where there is no any treatment facility and the disinfections is made in primitive way – mainly by using hydrated lime or other chlorine substances, very rarely and in non-proper dosages. The main reasons for diversion from the microbilogical standards are: the manual way of disinfections, the old equipment used, old fashion scheme of water supplying, including the improper disinfections facilities positioning, or their insufficient number, the lack of

[11]National Strategy for Environment and Action plan for 2000 - 2006 г.

treatment facilities, and some reasons of subjective nature. The problem could be solved if the required modern facilities for water disinfections are constructed.

Deviations from the nitrate standards

This is a national problem, but mostly it occurs at some agricultural regions. Generally, the values diverge from the required norms of up to about twice the standard rate (50 mg/l), but at some watercourses they reach over four times the admissible limits. Most often the contaminations with nitrates concern the shallow underground watercourses (springs, water wells and drill holes), located at cultivated agricultural lands, or closed to settlements, and the water taken form non-protected water basins. The problem is of health importance. The problem is caused by the improper use of nitrogen mineral fertilizers in the near past, as well as by the wrongful agricultural and farm experience, as a whole.

This problem could be solved by construction of new potable water treatment facilities for each watercourse, or by mixing of waters of problematic ones with such with good quality, so that the nitrates to be reduced to the admissible value.

Deviations from the organoleptic standards (color, smell, taste, turbidity)

This is a national problem, but mostly deviations are typical for water supply systems, taking water from surface watercourses, for which water treatment plants (WTP) are not constructed. The problem does not create any direct danger to the human health.

It could be resolved by the construction of treatment plants for potable water supply using surface water. In some cases, the construction of treatment plants for underground water is also required.

Deviations from the manganese and iron indexes

The problem is predominately of regional importance – Haskovo, Stara Zagora district, etc. but not of direct health importance. The problem is caused mainly by the lack of treatment and demanganization plants (required for the underground water with high content of manganese and iron), as well as by the old water supply pipelines.

This problem can be resolved by the construction of the above-mentioned facilities and by the replacement of water supply pipelines.

Deviations from the heavy metals standards (predominately, chrome)

The problem concerns the Pleven district, and it is of health importance because of its toxic and carcinogen nature. The main reason is the use of watercourses of natural reduced parameters, and the lack of water treatment facilities.

The possible solution is the construction of new water resources, the water treatment, or its mixing with water of better quality standard, for reaching the admissible chrome content.

Water supply restrictions

A large number of settlements of the country are put under restricted water supply regime,

especially in the summer and autumn periods. The restricted water supply regime, as a rule, always causes problems with respect to the water quality.

The analyses show that big reserves for more-efficient use of the water resources are available. At first place, it can be achieved by reducing the total loss of water along the whole water supply system length. The water losses, according to some calculations, are about 57 %, which is caused by a technical reasons, as well as low fee collection rate and water sales.

The improvement of the water quality to meet the required potable water standards is realized at 42 potable water treatment plants (PWTP). They have a total designed capacity of 480 505 thousand m^3/annum, representing 42,1% of the total water quantity supplied to the water supply systems. While the water supply infrastructure is comparably well developed, and the central water supply system serve almost the whole population, the degree of completeness of the sewerage systems and of the town water treatment plants is considerably lower, or insignificant.

4.2.2 Sewerage system

For the country as a whole, sewerage systems and external collector of 9 013 km have been constructed. The number of the settlements with completely or partly constructed sewerage systems is 277, of which 167 are located at urban areas. The percentage of the towns with completed sewerage systems is 70,2%, and of the villages - 2,1%. The inhabitants connected to the sewerage systems is 3 800 216.[12]

The sewerage systems are mostly of a mixed type, or of a gravitation type, being constructed by concrete and steel-concrete pipes. Over 20% of them need urgent rehabilitation. Over 40%of them were constructed in the period of 1960 – 1965. They are not able to accept the increased flow rate of the wastewater, so they urgently need a total reconstruction.

Despite the unsatisfactory technical state of the sewerage systems and the insufficient degree of completeness, compatibility between the completeness of the sewerage systems and the available wastewater treatment plant is not available. Some of the wastewater treatment plants are overloaded, and other operates at lower capacity.

The National Monitoring and Control System is responsible for the preparation and improvement of the quality of the annual information cards providing data on the technological process, illegal water use, the consumed and discharged waters, technological water treatment schemes, as well as the physical and chemical analyses of the discharged waters.

4.2.3 Waste water treatment plant

The total percent of 66,8% from the population is connected to the available sewerage systems. In Bulgaria 62 UWWTP are operative. Thirty-four of them have been entirely completed and operating successfully, so there is no need to be extended, reconstructed or modernized. The remaining treatment plants are operative, but some additional measures should be undertaken, with respect to their extension, reconstruction and modernization. According to data taken form the last census, the operative treatment plants serve some 40% of the population, equal to 5 297 360 PE.[13]

[12] Source: Ministry of Regional Development and Public Works
[13] Program for application of Directive 91/271/EC for waste water treatment from settlements

At 12 settlements the construction of waste water treatment plants have been commenced, but it is still not completed, so the station is not operative. The inhabitants, who should be served by these newly constructed treatment plants, are over 2% of the whole population of the country. Despite the completion of the WWTP, some 35% of the sewerage system must be constructed.

For 19 settlements, being included in the National program for WWTP construction, the design documentation has been prepared. For four of them (Smolyan, Balchik, Shumen and Varna-Asparuhovo), a procedure of ISPA approval is under way. Seventeen of them were selected to be funded under some international programs such as: ISPA, PHARE – CBC assistance, etc.), or by Bulgarian government (central funding by the state budget or through EEAM). After the completion of their construction, the treatment plants shall serve 775 916 inhabitants, equal to 1 782 887 PE. About 80%of the required sewerage system at these settlement has been completed.

The remaining settlements in Bulgaria were also identified, where construction of water treatment plants should be carried out in compliance with Directive 91/271/EU, for which there are no data available or sufficient. The establishment are divided into two groups: of over 10 000 PE., and with 2 000 - 10 000 PE.
The number of the settlements with over 10 000 PE, in which WTP should be constructed is 55. The actual number of inhabitants, which should be served according to the last census of 2001 is 1 151 278 inhabitants, which transformed into PE is 1 730 960. Almost 40% of the sewerage system shall be completed.
With the construction of these treatment plants, generally 121 settlements of over 10 000 PE each, will have working WWTP, of which 113 must include tertiary treatment, in order to meet the requirements of the EU Directives for discharge in sensitive zones.
At 283 settlements with 2 000 - 10 000 PE , the respective treatment plants should be constructed according to the Directive's provisions. The actual number of inhabitants, which should be served by the sewerage system is 923 131, or in PE. - 1 107 757. The degree of completeness of the sewerage system network at these settlements is very low– about 25%.

The diagram below shows percentage of the population distribution in settlements (more than 200 PE) with WWTP, at different stages of constuction.

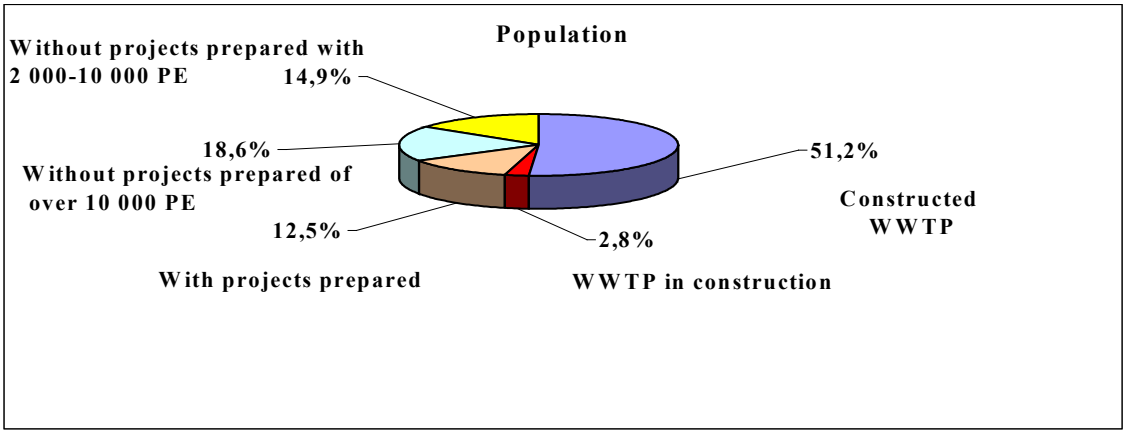

Figure 2 – Distibution of population in settlements with WWTP, at different stages of constuction

4.3 Waste

4.3.1 Domestic waste

For a very first time year 2001 technical data about 135 landfills was reported, including: existence of fence and guard; weighting of waste generated and entering the landfills; disposal technologies, implementation of the requirements of Regulation Nr.10 on the filling out the report and the waste management information documents (SG Nr.151/1998.) and regulation Nr.13 on the conditions and requirements for construction and operation of waste landfills /SG Nr.152/1998). (Table 8).

Technological data on domestic waste landfills	Number of landfills
Fencing – partial or complete	61
Guards – daily or round-the-clock	69
Incoming landfill control	50
Balances for incoming waste weighting	14
Daily soiling of the disposed waste	16
Weekly soiling of the disposed waste	14
Annual soiling of the disposed waste	50
Book of records under Regulation № 10/98	20
Proprietary monitoring	10

Table 8 – Technological data on domestic waste landfills

The results of inventory and estimation of 58 big municipality landfills serving the population of over 20 000 inhabitants show that all of them pose a potential threat to the environment. On Figure 3 the relation between the reserved areas depending on the estimated average risk is shown. In order the concrete remedial actions for each landfill to be determined, detail studies should be carried out.

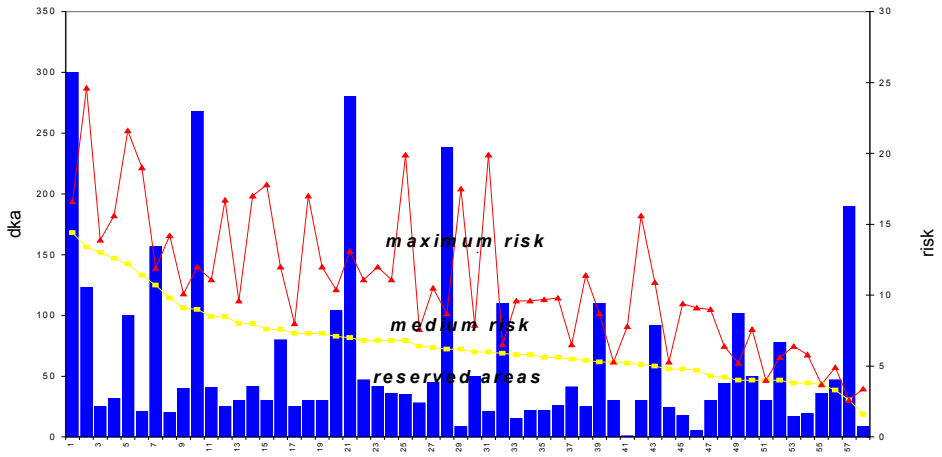

Figure 3 – Relations between reserved areas, depending on the estimated average risk[14]

Very high risk **High risk** **Medium risk** **Minimum risk**

[14] "The Green Book '2002"

1. Sofia – D.Bogrov
2. Pazardzhik
3. Asenovgrad
4. Lom
5. Balchik
6. Popovo
7. Varna
8. Karlovo
9. Razgrad
10. Russe
11. Silistra
12. Montana
13. Sevlievo
14. Sandanski
15. Teteven
16. Sliven
17. Shumen
18. Dupnitza
19. Samokov
20. Dobrich
21. Pleven
22. Yambol
23. Stara Zagora
24. Botevgrad
25. Veliko Tarnovo
26. Targovishte – old
27. Nova Zagora
28. Plovdiv
29. Peshtera
30. Dimitrovgrad
31. Petrcih
32. Burgas-Bratovo
33. Sozopol
34. Svishtov
35. Panagurishte
36. Razlog
37. Kustendil
38. Velingrad
39. Gorna Orjahovitza
40. Kardzhali
41. Troyan
42. Haskovo – Kamenetz
43. Pernik – Bela voda
44. Vidin
45. Smoljan
46. Svoge
47. Carnobat
48. Vratza
49. Gabrovo
50. Kazanlak
51. Pernik – TEVA
52. Blageovgrad
53. Harmanli
54. Gotze Delchev
55. Lovech
56. Aytos
57. Sofia-Suhodol
58. Targovishte-new

According to data of RIEW and municipal administrations, additional 5 135 non-regulated landfills at some small settlements and domestic waste contaminated areas, were identified.[15]

In the implementation of the national program for waste activities management for the period of 1999-2002, 22 landfills were constructed, reconstructed and put into operation, being in compliance with the Directive 1991/31/EU. At the same time, by the financial help of the EU under ISPA program, the construction of 6 new regional landfills for domestic waste disposal at the towns of Montana, Russe, Pernik, Sevlievo and Sozopol, was commenced. With funds granted by the state budget in 2003, construction of additional 8 regional landfills is under way. The newly constructed and reconstructed landfills, as well as those under construction, are shown in Appendix No.2.

4.3.2 Construction waste

The construction waste landfills are 35, at which 71% of the construction waste were disposed. The remaining quantities were disposed at the domestic waste landfills (23%) and at the industrial waste landfills (6%). The construction waste landfills are formed at abandoned quarries, marshy terrains, eroded bank and other negative relives, and they cover an area of 122.7 hca. For the recultivation of terrains, the soil mass from the excavation work was also disposed, as well waste inert materials from the production of the companies within the respective regions.[16]

4.3.3 Industrial waste

[15] Program for application of Directive 1991/31/EC for waste disposal
[16] "The Green Book '2002"

The preferred method for industrial waste removal is the **disposal**. As to this moment in the country 84 landfills for industrial non-dangerous waste, including 74 under operation and 10 closed have been identified. From the landfills under operation, 15 are designed for inert materials. In their basic part, the landfills have been constructed in the seventies and eighties, according to the effective legislation, by putting the requirements to the preparation of the main beds of landfill and the laying of the mineral insulation clay layer, the stabilization of the landfill form, etc. Considerable part of the existing landfills is found not to be in compliance with the regulations and the current technical standards. Therefore, serous investments for putting them in compliance are required, or for their closing. The construction of the needed plants as per the quantities and type of the generated waste, shall require considerable investments as to the waste utilization and removal, which must be ensured in a short period of time. The poor financial state and the low production volume of some industrial plants prevent the construction of the required waste treatment facilities.

About 85% of the volume of waste disposed was generated from non-organic chemical processes and from non-organic waste obtained from the thermal processes. About 97% of industrial waste is disposed at specialized landfills or other landfills, being used by the respective companies. The remaining 3% are disposed together with the domestic waste at the landfills owned by the municipality. Compared to the previous year, the portion of the industrial disposed waste has been increased by 3,71 %. This is owing to the increased volume of waste generated by the treatment plants, of which 99% are disposed.

In 2001, 59 881 t of industrial waste were removed through incineration. This method is used usually for waste being generated form wood or food processing. About 94% of them are incinerated immediately after their generation at the plant.

The quantity of the waste utilized by the agricultural sector is 60 660 t, generated mainly from the production and processing of food products, 58% of which were used as food for animals or as fertilizer.

The most of the generated waste of ferrous and non-ferrous metals, paper, plastic and glass has been handed over for further processing. In some cases the disposed waste was processed at the place of generation, or it was handed over for further processing to other companies, doing trade business with waste materials. The total volume of the processed waste in 2001 is 644 461 tones.

Recycling is organized entirely on a trade principle, and is restricted only to waste for which the price paid by the end used scarcely covers the expenses made for its collection, processing and transportation. The low price of the waste disposal in the country makes the investments in the recycling facilities and plants for waste utilization quite unreasonable.

4.3.4 Hazardous waste

The disposal is the main method used for removing the hazardous waste in the country, and for 2001, some 68%of the total volume of the generated waste were disposed. About 94% of the disposed hazardous waste was transported to specialized landfills or other landfills.

As to this moment, 18 landfills are under operation on the territory of the country, where hazardous waste are disposed, but none of them meet the requirements of Directive 1999/31/EU regarding the waste disposal. The available landfills are used entirely by the enterprises, which have generated the waste. Within the country there is no such facility that

can accept waste on a commercial base. Operating of some of the facilities at present is of direct risks to the environment. The number of the hazardous waste being closed is 13.

According to the information provided to the enterprises in 2001, the volume of the waste handed over for utilization purposes was 136 123 tones. The bigger quantity of the waste was utilized by the cement production plants, which use as a raw material for the production of cement – the slag received from the non-ferrous metallurgy, and the processed slag from the ships blasting.

In Bulgaria, two plants for used lead-acid batteries from the LZW "Kardzhali" and Monbat-Montana are operative. The only enterprise in the country for regeneration of used oils is Lubrika located at the town of Russe.

The hazardous waste treated by chemical methods and incineration in 2001 were 101 763 tones. At Lukoil-Nephtochim - Bourgas, a facility for incineration of petrol-containing sediments generated from this enterprise activity is under operation. The incineration as a method used mostly for the hospital waste removal – 35% of the total generated waste volume were incinerated at small installation, which in most of the cases do not meet the requirements placed before them.

In 2001, a pilot project of the World Bank for the environment protection at the region of Umikor Med JSC –Pirdop, was implemented. Under the project of the World Bank for environment protection, and privatization, the execution of activities for elimination of ecological damages caused by past action or inactions until the moment of privatization of three enterprises was performed: Asarel-Medet JSC – Panagurishte; Kremikovtzi JSC– Sofia and Nephtochim JSC – Bourgas. Some arrangements on the program for reduction of the ecological damages caused by actions or inactions happened before the privatization of three new enterprises were signed such as: Sofarma JSC– Sofia; Nephtochim JSC – Dimitrovgrad and Agropolychim JSC– Devnja.

Projects for conservation and recultivation of 5 landfills, containing waste from processing of ores for production of non-ferrous metals, were developed. During 2001, the technical and biological recultivation of 4 landfills was completed.

4.3.5 Main problems related to risk in waste management

4.3.5.1 Institutional relations and organization

At present all functions related to domestic waste management are assigned to the municipalities. The existing experience shows that the mayors of municipalities do not exercise to the required extent their powers regarding the control and disposal of the waste within their territory.

The lack at regional level of waste management additionally hinders the regional planning of infrastructure for domestic waste.

4.3.5.2 Capacity and human resources

The Administration is engaged in the control and management of waste, their collection, but the processing of the information and planning is still insufficient, especially at a municipal level.

Some measures were undertaken for the improvement of the required qualification of the staff engaged in the organization of activities related to the domestic waste management within the municipalities, though offering opportunities of training and exchange of specialists between different municipalities.

4.3.5.3 Funding and refunding of costs

The accumulated profits for the waste management are insufficient, and the expenses spent for the collection, processing and/or waste removal are lower for our country, then those of the EU member states.

4.3.5.4 Reporting and provision of information

Still the information on the waste is not of the required level as to the quantity, content and characteristics of waste, the methods applied for their utilization, investment and expenses for the waste management, which hinders the control and the decision making at municipal and national levels. This information should be available for a long period of time, so that it can be analyzed, so on this base, a clear strategy for future measures undertaking within the sector to be developed.

4.3.5.5 Utilization and recycling

Collection of waste for recycling is made on the base of purchasing from the population, but not on gratuitous handing over on their part. Recycling is organized entirely on a trade principle, and is restricted only to waste, where the price paid by the final user, covers just the costs for the waste collection, processing and transportation. The low price of disposal of the country makes the investments economically unreasonable for the plants and facilities for recycling and utilization, applying alternative methods such as composting and incineration with utilization of energy. The insufficient information about the content of waste, lack of experience in the field of waste composting, and the non-established market of composting on the territory of the country, are the main reasons for the non-application of composting as a method for waste utilization.

4.3.5.6 Collection and transportation

The extension of the rage of existing systems for organized collection of waste is the main problem put before the municipal administration, which resolving shall be connected with the increase of expenses. The transition to regional facilities for domestic waste removal shall considerably increase the expenses for waste transport, and shall require further investments for purchasing of new waste collection equipment.

4.3.5.7 Pre-treatment

The application of the requirements on the preliminary waste treatment prior to their disposal, and those on the reduction of the quantities of dispose bio-decomposable waste, shall be related to considerable investments on the part of the waste treatment plants.

V. FUNDING OF ENVIRONMENTAL PROJECTS BY NATIONAL SOURCES

The efforts towards providing of financial resources are focused on:

- Enterprise for environmental activities management.
- State and municipal budgets – mainly for the construction of public infrastructure sites in the field of the domestics waste treatment, and in some cases, of hazardous waste and waste water treatment.
- Financial resources of the European Union – ISPA and PHARE – National trans-boundary program, etc.
- Attraction of foreign investments for ecological projects in the field of power engineering, through application of the scheme "Joint Implementation", according to resources under the framework convention for climatic changes.
- Provision of resources from IFIs. Having in mind the extent of the resources, which Bulgaria will receive under ISPA financing and in the future - under the Cohesion fund, with the introduced rule for provision of precise percent national co-financing, the IFIs role will increase.
- Attraction of resources within the international agreements in the environmental field, and international donors programs, and bilateral agreements.
- Application of new swap-transactions "Debt for environment".
- Attraction of private investments for improving the quality of municipal services in the field of domestic waste management and cleanness of settlements, water supply, sewerage and water treatment, through granting of concessions. The attraction of foreign investments under this scheme is of a key importance for the municipalities, in view of renewal of the existing and construction of new infrastructure.

The maximum efficient utilization of funds requires:

- Prioritisation of projects to be funded based on clear criteria and succession in the course of time.
- Coordination of policies at national and local level, and improving of the information exchange.
- Improving the quality of the project preparation, so that to be competitive when submitted to the donors and IFIs.
- Improving the capacity of municipality towards attracting of private investments to the public services.
- Combining the efforts of municipalities towards resolving of problems of general importance.

VI. HARMONIZATION OF BULGARIAN LEGISLATION

The Bulgarian legislation in the environmental field was fully harmonized with the requirements of legislation of the European Union, according to the "Strategy for intensifying the negotiations for accession of the Republic of Bulgaria to the European Union and Action Plan". Bulgaria has closed the chapter related to the negotiations on the accessions of Bulgaria to the European Union under Chapter 22 "Environment" in June 2003, a year and a half earlier then the planned date. Since 1997 until now, in Bulgaria, 8 framework laws were accepted, as well as the most of the related sub-legislative normative acts:

Sector	Investment costs	Annual Investment Costs[1]	Operation and maintenance costs	Total per annum

	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Air pollution								
- Heating by coals	543	752	64	88	95	132	159	220
- Transport/fuel	2,103	2,103	247	247	219	219	466	466
- TPP	424	586	58	96	45	64	103	160
Potable water	246	1,463	29	172	16	53	45	225
Sewerage	734	1,114	86	131	16	22	102	153
Wastewater treatment	476	850	56	100	49	102	105	202
Waste management	850	1,150	100	135	93	132	193	267
Nitrates	103	155	12	18	-	-	12	18
Other [2]	30	30	3	3	12	12	15	15
Total costs[3]	5,509	8,203	655	990	545	736	1,200	1,726

Table 9 - Amounts needed by the environment sector for accession of Bulgaria to the European Union (mln. €)

Remarks:

1. It includes costs related to public administration consolidation and funds for environment protection.
2. Excluding the costs for nuclear safety and restoration of old contaminated areas. It partly includes investment costs in transport and industry branches.
3. It includes other expenses for environment protection, determined not by the EU Directives, but by individual market directives.

The obligations are related mainly to the municipal and private sectors. For the water, air, and waste sector, the total amount of the required investments for the period of 2000-2006 is 3 081 mln. € , aimed at the completion of the transposition of the European legislation 2015, and of 2 409 mln. €, if the complete transposition will be finished until 2020.

The presented assessment of the needed amounts is prepared with the assistance of World Bank experts. This was confirmed during 2003 by the assessment of needed investment costs for achieving concurrence with the Directives, with which Bulgaria agreed transitional periods for implementation.

It should to be stressed that ISPA is viewed not separately, but as one of the potential resources for financing investments in the environment sector. Apart from the mobilization of other potential financial resources for the realisation of the projects, underlied in the present Strategy, Bulgaria will rely on resources from the Cohesion Fund, as well.

VII. PROJECTS SELECTION CRITEARIA TO BE FUNDED UNDER ISPA PROGRAM

7.1 Main criteria

The main criteria used for investment projects prioritisation are:

- Protection, control and improvement of the state of the environment;
- Conformity to the main objectives of the EU policy in the environmental sector:
  - Reduction and prevention of the human health risk;
  - Reduction and prevention of impact to the vulnerable ecosystems;
  - Sustainable and rational use of natural resources;
- Compliance with the EU environmental principles:
  - Preventive activities for protection of the environment;
  - identification and ceasing of the pollution at its source;
  - Effective application of the "polluter pays" principle;
- Correspondence with the priorities at "Strategy for intensifying the negotiations for

accession of the Republic of Bulgaria to the European Union and Action Plan"which contributes to the implementation of the requirements of the directives, falling within the scope of the ISPA instrument;

- The project contributes to fulfilling the commitments of the country resulting from the international contract and agreements;

7.2 Specific criteria – air

- Location of regions classified as "hot spots";
- The number of population exposed to risk;

7.3 Specific criteria – water

7.3.1 Potable water and water supply

- Supplying of the required quantity of potable water in compliance with the national and European standards; Resolving the problem with potable water deviated from the water quality standards;
  - Improvement of the potable water quality – number of inhabitants covered;
  - Improvement of the water supply services;
  - Number of inhabitants supplied with potable water quality deviated from the standard indexes;
  - Number and values of deviated indexes of the following priority:
    - Microbiological indexes;
    - Chemical indexes;
    - Indexes of indicative significance

- Supplying of the required quantity of potable water to all settlements in Bulgaria, in compliance with national and European;
  - Resolving the problem with the restricted water supply - number of inhabitants covered;
  - Resolving the problem with the non water supplied settlements - number of inhabitants covered;
  - Reduction of the losses and leakages of water along the water supply system network;
  - Reduction of the operation costs within water supply sector;
  - The project gains thrifty water usage;

7.3.2 Sewerage system and UWWTP construction

For accomplishing the objectives of Directive 91/271/EU on wastewater treatment, an Implementation Programme of Directive 91/271/EU was developed. The Program contains data on the state of the sewerage system network, and the existing of UWWTPs on the territory of the country; the required investments for the settlements were determined, as well as their prioritisation based of the following criteria:

- Meeting the emission standards of harmful and hazardous substances contained in the wastewater;
- Requirements to the wastewater receiving body:
  - At regions of "sensitive zones" as declared;
  - At regions of protected areas;
  - At regions differentiated for bathing;

  - At regions of current and prospective water use, or within sanitary zones of the Black Sea aquatory;
  - At sanitary zones;
  - At the upper stream of the water receiving body;
- International commitments of Bulgaria;
- The value of the wastewater load and the risk to the human health, and the water quality at the water receiving body.
- Degree of completeness and usage of the existing sewerage system and of water treatment plant under construction.
- Project readiness
- The required capital expenses for the WWTP construction and operation compared to the expected effect to the environment.

7.4 Specific criteria - waste

- National and regional importance of the site;
- Project readiness for realization;
- Promptness of the problems resolving, depending on the project realization.

VIII. Priority projects to be funded under ISPA

The list of projects enclosed to the Strategy is indicative, as well as the distribution of funds form different financial sources.

The project pipeline as submitted water selected among the priority ecological sites of the country, falling into the National branch programs, as developed by the Bulgarian government and the Application programs for certain EU Directives. They are purposed at the resolving of problems of a regional importance. The implementation of these projects shall be the main step towards the efficient application of the requirements of European legislation within the water, air and waste sector. It should be emphasized that the application of these programs is already under way, and the implementation of some of the investment priority sites has already being financed by national funds, and in some cases – by the financial support of foreign donators and financial institutions.

Submission of projects for approval in different years is conformed by degree of priority, the project readiness of each site, and the chance of ensuring co-funds from national sources and through credit instruments.

Having in mind the necessity for strengthening the capacity of the local powers for new assets management of each project, which will require financing during 2003 and following years, a "technical assistance" component is stipulated, referring to the relevant beneficiaries and chosen operators of future assets.

IX. APPENDIX 1 – INDICATIVE LIST OF INVESTMENT PROJECTS OF PRIORITY TO BE FUNDED UNDER ISPA PROGRAM

Nr.	Project name	Financial sources	Total amount in EUR	Status	Related projects
Proposals for 2000					
1	UWWTP – Stara Zagora, Dimitrovgrad.	ISPA, National sources	43,4	Approved in 2000	
2	Set of Six Regional Waste Disposal Sites - Montana, Pernik, Ruse, Sevlievo, Silistra and Sozopol located in Bulgaria.	ISPA, National sources	60,577	Approved in 2000	▪ Investigation for optimization if the existing system for collection and transportation of waste and development of closing and rehabilitation of the existing landfills at 6 regions: Montana, Pernik, Russe, Sevlievo, Silistra and Sozopol. ▪ Updating of tender documents for construction of 6 regional landfills for domestic waste at Montana, Pernik, Russe, Sevlievo, Silistra and Sozopol. ▪ National program for reduction of risks from landfills and past contaminated areas in Bulgaria. ▪ Construction of accompanying infrastructure and/or first stage of the construction of regional landfills at Russe and Sevlievo. ▪ Preparation of Manual on past contaminated areas.
	TOTAL for 2000		**103,977**		
Proposals for 2001					
3	Wastewater Treatment located in Blagoevgrad, Republic of Bulgaria.	ISPA, National sources	12,580	Approved in 2001	▪ Identification of "sensitive zones" in basins of the rivers of Struma, Tundzha and Maritza ▪ Construction of main collector ▪ Preparation of future investment measures in the field of water cycle for 12 regional W&S systems
4	Wastewater Collection and Treatment located in Pazardjik, Republic of Bulgaria.	ISPA, National sources	19,110	Approved in 2001	▪ Identification of "sensitive zones" in basins of the rivers of Struma, Tundzha and Maritza
5	Regional Wastewater Treatment and	ISPA, National	16,633	Approved in	▪ Construction of main collector

	Collection located in Gorna Oriahovitza, Republic of Bulgaria.	sources		2001	
	TOTAL for 2001		**48,323**		
Proposals for 2002					
6	Wastewater Collection and Treatment located in Sevlievo, Republic of Bulgaria.	ISPA, National sources	13,987	Approved in 2002	
7	Wastewater Collection and Treatment located in Popovo, Republic of Bulgaria.	ISPA, National sources	11,860	Approved in 2002	
8	Wastewater Collection and Treatment located in Lovech, Republic of Bulgaria.	ISPA, National sources	18,396	Approved in 2002	
9	Wastewater Collection and Treatment located in Montana, Republic of Bulgaria.	ISPA, National sources	16,741	Approved in 2002	▪ Preparation of future investment measures in the field water cycle for 12 regional W&S systems
10	Wastewater Collection and Treatment located in Bourgas-Meden Rudnik, Republic of Bulgaria.	ISPA, National sources	10,206	Approved in 2002	▪ Preparation of future investment measures in the field water cycle for 12 regional W&S systems
11	Wastewater Collection and Treatment located in Targoviste, Republic of Bulgaria.	ISPA, National sources	15,235	Approved in 2002	
	TOTAL for 2002		**86,425**		
Proposals for 2003					
12	Technical aid for preparation of project for sewerage system construction – Sofia	ISPA, National sources	1,5	Submitted to be funded in 2002	▪ Extension and rehabilitation of UWWTP – Sofia
13	UWWTP – Shumen.	ISPA, National sources	30,1	Submitted to be funded in 2002	▪ Construction of fist stage of mechanical treatment at UWWTP – Sofia
14	UWWTP – Varna-Asparuhovo	ISPA, National sources, EBRD shows interest in	25,4	Submitted to be funded in 2002	▪ Extension and rehabilitation of UWWTP – Varna
15	Water and Wastewater Collection and treatment for the town of Smolyan	ISPA, National sources	24,5	Submitted to be funded in 2002	▪ Preparation of tender documents for construction of UWWTP, and completion and rehabilitation of W&S systems of city.

16	Construction of desulpharization plant - units 5 and 6 of TPS "Maritza -East 2"	EBRD, ISPA, National sources	75,0	Submitted to be funded in 2001	▪ Construction of desulphurization facility at blocks 7 and 8 of TPP "Maritza-East 2" – operates since October 2002.
17	Upgrade of the Wastewater assets in the town of Balchik	ISPA, National sources	21,8	Submitted to be funded in 2002	▪ Preparation of investment project "FS for water cycle of the town of Balchik"
18	Technical assistance for preparation of projects in the water sector of 12 S&W regional systems – Bourgas, Yambol, Kardzhali, Sliven, Stara Zagora, Plovdiv, Pernik, Kustendil, Blagoevgrad, Russe, Vratza, and Montana.	ISPA, National sources	16,0	Being submitted 2003	▪ Administrative consolidation at national and local levels for application of Directives, introducing the relative requirements to drinking water, water for bathing and swimming purposes, and costal waters.
19	Regional center for waste management - Kardzhali.	ISPA, National sources	14,5	Submitted to be funded in 2003	▪ TA for improving the administrative capacity of waste management from two pilot municipalities – Kardzhali and Lom
20	Technical assistance for institutional stabilization of MOEW for funds management under ISPA program, and preparation of the Cohesion fund.	ISPA, National sources	3,6	Submitted to be funded in 2003	
21	Technical assistance for preparation of investment projects in the field of waste management for 6 regions.	ISPA, National sources	1,7	Under preparation	▪ Preparation of pre-investment study of six measures for regional waste management, for co-funding under ISPA program
22	Technical assistance for project development for integrated management of the Iskar River basin.	ISPA, National sources	0,8	Under preparation	▪ Establishment and institutional stabilization of water management authorities in Bulgaria
	TOTAL for 2003		**214,9**		
Proposal for 2004					
23	National center for hazardous waste.	ISPA, National sources, EIB shows interest in	54,0	Under preparation	▪ Administrative improvement at national and regional levels for waste management – construction of national system of hazardous waste management
24	Project on closing of old contaminated areas within Sofia region.	ISPA, National sources, EBRD shows interest in	20,0	Under preparation	
25	Waste regional management – Kocherinovo.	ISPA, National sources	22,2	Under preparation	▪ Identification of municipal investment projects of environment protection.

					▪ Preliminary investigations and preparation of tender documents for closing of existing old contaminated areas
26	Reduction of Emissions into the Ambient Air of the town of Pernik from the District Heating and Thermal Power Plant "Republika" by replacing the capacity of the old boilers No 1-4 – a fluidised bed boiler, and installing a desulphurisation equipment for boiler 5	ISPA, National sources	35,0	Under preparation	
	TOTAL for 2004		**131,2**		
Proposal for 2005					
27	Investment measures in the water sector for 6 W&S regional systems – Bourgas, Yambol, Kardzhali, Sliven, Stara Zagora, Plovdiv.	ISPA, National sources	160,0	Preparation shall start in 2004	
28	Waste regional management – Bourgas.	ISPA, National sources	10,0	Preparation shall start in 2004	
29	Waste regional management – Vidin.	ISPA, National sources	10,0	Preparation shall start in 2004	
30	Waste regional management – Dobrich.	ISPA, National sources	10,0	Preparation shall start in 2004	
31	Completion of sewerage system network - Sofia	ISPA, National sources	67,0	Preparation shall start in 2004	
	TOTAL for 2005		**257,0**		
Proposal for 2006					
32	Investment measures in the water sector for 6 W&S regional systems- Pernik, Kustendil, Blagoevgrad, Russe, Vratza and Montana	ISPA/Cohesion Fund, National sources	160,0	Preparation shall start in 2004	
33	Waste regional management – Pazardzhik.	ISPA/Cohesion Fund, National	10,0	Preparation shall start in	

		sources		2004	
34	Waste regional management – Pleven.	ISPA/Cohesion Fund, National sources	10,0	Preparation shall start in 2004	
35	Waste regional management – Provadia.	ISPA/Cohesion Fund, National sources	10,0	Preparation shall start in 2004	
	TOTAL for 2006		**190,00**		

X. APENDIX 2 – NEWLY CONSTRUCTED AND RECONSTRUCTED LANDFILLS AND LANDFILLS UNDER CONSTRUCTION